

Response Under 37 CFR 1.116

Expedited Procedure

Examining Group 1796

Application No. 10/539,789

Paper Dated: December 18, 2009

In Reply to USPTO Correspondence of August 18, 2009

Attorney Docket No. 4385-051182

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claims 1-24 (Cancelled).

Claim 25 (Currently Amended): A direct synthesis process for preparing etherified melamine resin condensates with weight-average molecular weights from 500 to 50,000, the melamine resin condensates are free from hydroxymethyleneamino groups bonded to the triazine rings of the melamine resin condensate and from $\text{-NH-CH}_2\text{-O-CH}_2\text{-NH-}$ groups linking triazine rings wherein

a) in the first step of the reaction, an etherified melamine resin precondensate is prepared from melamine and formaldehyde in alcoholic solution, whereby the molar ratio of melamine to formaldehyde is 1:2 to 1:4,

b) the concentration of the etherified melamine resin precondensate in alcoholic solution is increased in a first vaporization step until the solids content of the etherified melamine resin precondensate is from 65 to 85% by weight, and

c) the concentration of the etherified melamine resin precondensate is increased in a second vaporization step until the precondensate has a concentration from 95 to 99% by weight,

d) C₄-C₁₈ alcohols, diols of the type represented by HO-R-OH or tetrahydric alcohols based on erythritol or both is added to the melamine resin precondensate after the concentration-increase process from 95 to 99 % by weight, and

e) e) in a second step of the reaction, the increased-concentration melamine resin precondensate

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is reacted using a mixer, such as a kneader.

Claim 26 (Previously Presented): The direct synthesis process according to claim 25, wherein, after the second step of the reaction, the etherified melamine resin condensate is discharged and pelletized.

Claim 27 (Previously Presented): The direct synthesis process according to claim 25, wherein the alcohol in the first step of the reaction is methanol.

Claim 28 (Previously Presented): The direct synthesis process according to claim 25, wherein, in the first step of the reaction, a methylation of the melamine takes place with a subsequent etherification.

Claim 29 (Previously Presented): The direct synthesis process according to claim 25, wherein, in the first step of the process, at least one of formaldehyde and paraformaldehyde is used in the form of formalin solution at variable concentration.

Claim 30 (Previously Presented): The direct synthesis process according to claim 28, wherein the methylation takes place at a pH of from 7 to 9 and the etherification takes place at a pH of from 5.5 to 6.5.

Claim 31 (Previously Presented): The direct synthesis process according to claim 25, wherein, in the first step of the reaction, a methylation and an etherification of the melamine take place simultaneously.

Claim 32 (Previously Presented): The direct synthesis process according to claim 31, wherein the first step of the reaction takes place at a pH of from 5.5 to 6.5.

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Claim 33 (Previously Presented): The direct synthesis process according to claim 25, wherein the first step of the reaction takes place in the presence of acidic, or of a mixture of acidic and basic, ion exchangers.

Claim 34 (Previously Presented): The direct synthesis process according to claim 25, wherein, in the first step of the reaction, a reaction temperature of from 70 to 160°C is established.

Claims 35 and 36 (Cancelled).

Claim 37 (Previously Presented): The direct synthesis process according to claim 25, wherein the vaporization of the low-molecular-weight components takes place in two stages.

Claim 38 (Previously Presented): The direct synthesis process according to claim 25, wherein use is made of at least one diol represented by the type HO-R-OH with molecular weight of from 62 to 20 000 or of a mixture of at least two diols represented by the type HO-R-OH with molecular weights of from 62 to 20 000, where the substituent R may have one of the following structures

C₂-C₁₈-alkylene,

-CH(CH₃)-CH₂-O-(C₂-C₁₂)-alkylene-O-CH₂-CH(CH₃)-,

-CH(CH₃)-CH₂-O-(C₂-C₁₂)-arylene-O-CH₂-CH(CH₃)-,

-(CH₂-CH₂-CH₂-CH₂-CH₂-CO-)_x-(CH₂-CHR)_y-

-[CH₂-CH₂-O-CH₂-CH₂]_n-,

-[CH₂-CH(CH₃)-O-CH₂-CH(CH₃)]_n-,

-[-O-CH₂-CH₂-CH₂-CH₂-]_n-,

-[(CH₂)₂₋₈-O-CO-(C₆-C₁₄)-arylene-CO-O-(CH₂)₂₋₈]-_n-,

-[(CH₂)₂₋₈-O-CO-(C₂-C₁₂)-alkylene-CO-O-(CH₂)₂₋₈]-_n-,

where n = 1 - 200; x = 5 - 15;

sequences which contain siloxane groups and are represented by the type

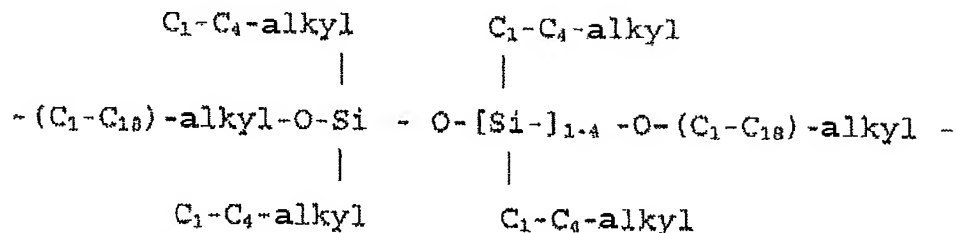
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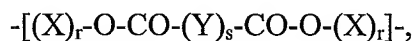
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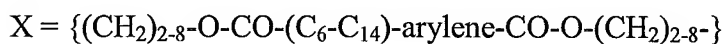
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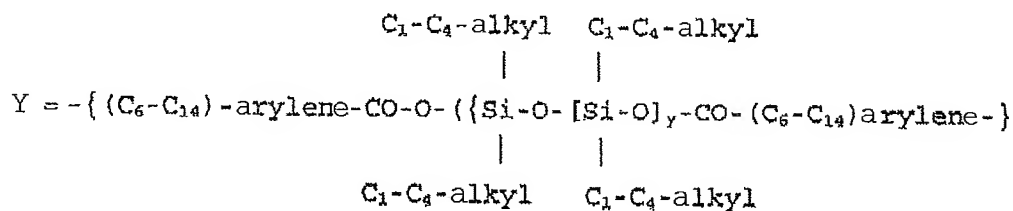
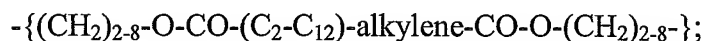
polyester sequences which contain siloxane groups and are represented by the type



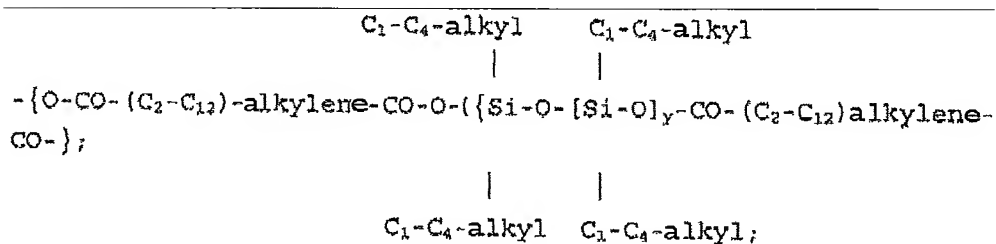
where



or



or

where $r = 1 - 70$; $s = 1 - 70$ and $y = 3 - 50$;

polyether sequences which contain siloxane groups and are represented by the type

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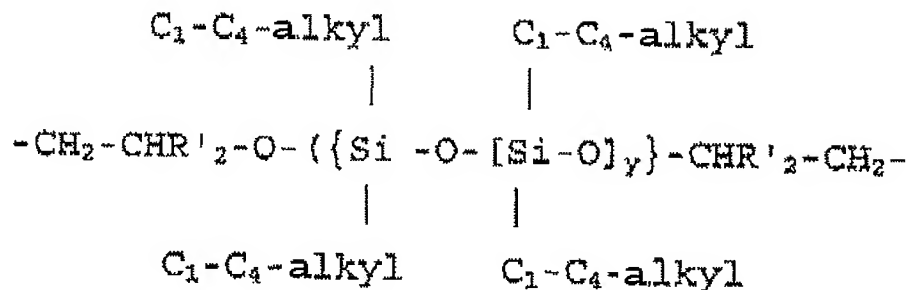
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where $R'_2 = \text{H}$; $\text{C}_1\text{-C}_4\text{-alkyl}$ and $y = 3 - 50$;

sequences based on alkylene oxide adducts of melamine and represented by the type of

2-amino-4,6-di-($\text{C}_2\text{-C}_4$)alkyleneamino-1,3,5-triazine sequences

phenol ether sequences based on dihydric phenols and on $\text{C}_2\text{-C}_8$ diols and represented by the type of

$\text{-(C}_2\text{-C}_8\text{)alkylene-O-(C}_6\text{-C}_{18}\text{)-arylene-O-(C}_2\text{-C}_8\text{)-alkylene}$ sequences.

Claim 39 (Previously Presented): The direct synthesis process according to claim 25, wherein the etherified melamine resin condensates are mixtures with weight-average molecular weights of from 500 to 2,500 composed of tris(methoxymethylamino)triazine and its higher-molecular-weight oligomers.

Claim 40 (Previously Presented): The direct synthesis process according to claim 25, wherein, prior to or during the concentration-increase process or both, i.e. prior to the first and/or prior to the second vaporizing stage and/or after the concentration-increase process, i.e. prior to the second step of the reaction, anhydrides and/or acids dissolved in alcohols or in water are added to the melamine resin precondensate.

Claim 41 (Previously Presented): The direct synthesis process according to claim 25, wherein the kneader is a continuously operating, at least to some extent self-cleaning, extruder with vacuum venting.

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Claim 42 (Previously Presented): The direct synthesis process according to claim 25, wherein the kneader used comprises a twin-screw extruder with vent zones.

Claim 43 (Previously Presented): The direct synthesis process according to claim 41, wherein, in the continuous kneader, up to 75% by weight of at least one of fillers, reinforcing fibres, other reactive polymers of the type represented by ethylene copolymers, maleic anhydride copolymers, modified maleic anhydride copolymers, poly(meth)acrylates, polyamides, polyesters and polyurethanes are also incorporated, as are up to 2% by weight of at least one of stabilizers, UV absorbers and auxiliaries, each weight being based on the etherified melamine resin condensates.

Claim 44 (Previously Presented): The direct synthesis process according to claim 25, wherein the first step of the reaction is executed in a stirred tank or in a continuous reactor.

Claim 45 (Previously Presented): The direct synthesis process according to claim 25, wherein the process is carried out either continuously or batchwise.

Claim 46 (Previously Presented): The direct synthesis process according to claim 25, wherein the melamine resin condensates are free from hydroxymethyleneamino groups bonded to the triazine rings of the melamine resin condensate and from -NH-CH₂-O-CH₂-NH- groups linking triazine rings.

Claim 47 (Previously Presented): Melamine resin products, produced via a melamine resin condensate etherified using a direct synthesis process according to claim 25.

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Claim 48 (Previously Presented): The direct synthesis process according to claim 34, wherein, in the first step of the reaction, a reaction temperature of from 95 to 100°C is established.